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Title: Product Assortment Optimization Systems, Products and Methods

I claim:

1. A method for improving a retailer's total performance of a product assortment, comprising:

- (a) categorizing the product assortment into a plurality of categories;
- (b) calculating a performance function for at least one category that describes the relationship between the number of products in the category and the performance of that category, wherein the performance function predicts the effect of removing or adding category products on performance of the category; and
- (c) improving the retailer's total performance by determining the number of products to sell in each category based on the performance function for each category.

2. The method of claim 1, wherein the step of categorizing the product assortment comprises categorizing the product assortment according to substitutability.

3. The method of claim 2, further comprising ordering the products in each category according to performance.

4. The method of claim 2, wherein products that are always or sometimes substituted for each other are placed in the same category.

5. The claim of 1, wherein performance is defined as revenue, profit or number of units sold.

6. The method of claim 1, wherein performance is defined as revenue divided by product size, profit divided by product size or number of units sold divided by product size.

7. The method of claim 3, wherein the step of improving the retailer's total performance comprises determining the number of products in each category whose addition to the category meets a performance measure.

8. The method of claim 3, wherein the step of improving the retailer's total performance comprises finding the number of products in each category which generates an optimized sum of performance for all categories.

9. The method of claim 3, wherein at least one performance function is calculated based on the retailer's performance data and product assortment.

10. The method of claim 3, wherein at least one performance function is calculated based on data from different time periods.

11. The method of claim 3, wherein at least one performance function has a diminishing performance for each additional product added.

12. The method of claim 3, wherein each performance function shows a performance value of zero when zero products are sold.

13. One or more computer-readable media comprising computer executable program instructions that, when executed, direct a computer system to:

- (a) categorize the product assortment into a plurality of categories;
- (b) calculate a function for each category that describes the relationship between the number of products in the category and the performance of that category, wherein the performance function predicts the effect of removing or adding category products on performance of the category; and
- (c) improve the retailer's total performance by determining the number of products to sell in each category based on the performance function for each category.

14. The computer readable media of claim 13, wherein the program instructions, when executed, direct a computer system to categorize the product assortment by categorizing the product assortment according to substitutability.

15. The computer readable media of claim 14, further comprising program instructions that, when executed, direct the computer system to order the products in each category according to performance.

16. The computer readable media of claim 14, wherein the computer-executable program instructions, when executed, direct the computer system to categorize products into the same category if they are always or sometimes substituted for each other.

17. The computer readable media of claim 15, wherein the program instructions for improving the retailer's total performance, when executed, direct the computer system to determine the number of products in each category whose addition to the category meets a performance measure.

18. The computer readable media of claim 15, wherein the computer executable program instructions for improving the retailer's total performance, when executed, direct the computer system to iteratively increase a performance measure that each product must meet until the total number of products across all categories is not greater than the total number of products that the retailer can carry, wherein the performance measure tests the increase in category performance likely to be caused by adding each product to its category.

19. The computer readable media of claim 15, further comprising computer-executable program instructions that, when executed, direct the computer system to calculate at least one performance function based on the retailer's performance data and product assortment.

20. The computer readable media of claim 15, further comprising computer-executable program instructions that, when executed, direct the computer system to calculate at least one performance function based on data from different time periods.

21. The computer readable media of claim 15, further comprising computer-executable program instructions that, when executed, direct the computer system to calculate at least one performance function that has a diminishing performance for each additional product added.

22. The computer readable media of claim 15, further comprising computer-executable program instructions that, when executed, direct the computer system to calculate each performance function to have a performance value of zero when zero products are sold.

23. A method of categorizing products in a product assortment, comprising :  
(a) grouping products that customers do not substitute for each other into different categories; and  
(b) grouping products that customers sometimes or always substitute for each other into the same category.

24. The method of claim 23, further comprising ordering the products in each of said categories according to the order of their performance.